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(19) (CA) **CANADIAN PATENT** (12)

(54) Extruder Head for Making a Patterned Block of an Ice Cream Product

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Abstract

An extruder head for differently coloured streams of an ice cream product feeds these streams through a series of interlaced tubes and subtubes to a mould over which a carton is placed to receive a block of the product. The mould is divided into a series of compartments that depict a desired pattern of different colours for the block.

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Extruder head for making a patterned block of an ice cream product

Field of the Invention

The invention relates to an extruder head for extruding streams of an ice cream product of at least two (preferably three) colours into a carton to form a patterned block of the product in such carton. The resulting block will have a substantially uniform cross-section throughout its length, such cross-section defining a pattern of different colours. As a result, this same pattern will appear wherever the block is later subject to a transverse cut.

Prior Art

It is known to package ice cream by extrusion into a carton to form a block. Moreover, it is known to use more than one colour, for example to form a block in the so-called Neopolitan style, in which three colours of ice cream are layered in a single block.

Summary of the Invention

The present invention enables the formation of a block of ice cream or related frozen product (referred to herein generally as an "ice cream product") in which a more complex pattern of colours is formed.

The pattern may depict an animal, as in the example described below, or any other object, animate or inanimate,



such as a person, a plant, a scene, a building, a flag or other emblem, a trophy, one or more letters or words, a trade mark, or any other distinctive representation that may or may not be partially or wholly surrounded by a border portion of the pattern.

To this end, the invention provides an extruder head consisting of (a) an elongate mould having (i) an outer peripheral wall conforming to the cross-sectional shape of the carton for receiving the carton thereon, and (ii) inner wall portions within said peripheral wall, said inner wall portions dividing the mould into a plurality of separate compartments defining said pattern, and (b) tube means for conveying streams of an ice cream product of at least two (preferably three) different colours to an inner end face of said mould for travel along said mould into the carton when said carton is mounted on the outer peripheral wall of the mould, whereby to form said block, (c) said tube means comprising (i) a main tube for conveying each of said streams from a respective ice cream product making machine, and (ii) a plurality of subtubes extending from each main tube to said inner end face of the mould, (iii) said subtubes being so sized and directed as to feed into each respective said compartment a said stream of the colour required for forming said pattern in an amount required to occupy the cross-sectional area of said compartment.

The extruder head will preferably be designed for three different colours of an ice cream product, and can even extend to a fourth or further colours, if desired. Nevertheless, the invention can be used to form a pattern having only two colours, for example a representation of the Canadian flag. The invention enables the formation of a pattern of this type in which the colours are not simply placed side-by-side, as in the Neopolitan style of packaging mentioned above, but are interwoven in a more complex pattern. Usually, but not necessary, one or more

colours will surround, or nearly surround, another colour. Apart from patterns like the Canadian flag where a central white bar portion will completely surround a central red portion depicting the maple leaf, the outline of many patterns will often be best set off by a peripheral surround or near-surround of another colour, as will be evident from the specific embodiment described below.

Brief Description of the Drawings

Figure 1a is a front view of an extruder head according to one embodiment of the invention;

Figure 1b is an enlarged view of the central portion of Figure 1a;

Figure 2a is a side view of the extruder head as seen from the right hand side of Figure 1a, i.e. on the line 2a-2a in Figure 1a;

Figure 2b is an enlarged view of the central portion of Figure 2a, i.e. as seen on the line 2b-2b in Figure 1b;

Figure 3a is a rear view of the extruder head as seen from the right hand side of Figure 2a, i.e. as seen on the line 3a-3a in Figure 2a;

Figure 3b is an enlarged view of the central portion of Figure 3a, i.e. as seen on the line 3b-3b in Figure 2b;

Figure 4a is a corner rear view of the extruder head as seen from half way between the views of Figures 2a and 3a;

Figure 5 is an end view of a mould portion of the extruder head, as seen on the line 5-5 in Figure 1a; and

Figure 6 is a diagrammatic representation of the product formed by such extruder head.

Description of the Embodiment

The extruder head H receives an ice cream product in three different colours A, B and C from conventional ice cream making machines (not shown). The extruder head H includes an elongate mould M over which in the conventional manner an empty carton (not shown) is placed to receive the extruded ice cream in the form of a block. The

rectangular shape of the mould M, as best seen in Figure 5, complements that of the carton which fits slidingly over the outer periphery of the mould M as defined by an outer peripheral wall 10. Inside this outer wall 10 the mould is furnished with a main inner wall portion 11 that is shaped to define the outline of the required representation, which, in the example shown, is the outline of a Panda bear. Within the main inner wall portion 11 there are various subsidiary inner walls portions 12 that serve to divide the pattern into a plurality of separate compartments. In addition, inner wall portions 13, 14 and 15 form tubes that serve further to define small parts of the pattern.

All the wall portions 10 - 15, which together define the pattern of colours to appear in the ice cream product block, continue in the same relationship to one another from the mouth 16 of the mould to a plate P3 that defines the inner end face of the mould, i.e. the cross-section of the mould remains uniform from its inner end to its mouth.

As indicated above, the invention is not limited to any particular pattern. By the same token the outer wall 10 of the mould need not necessarily be rectangular, but can be circular or any other shape that will fit the carton into which the ice cream is to be extruded.

The head H receives the ice cream product in colours A, B and C, in respective main tubes A1, B1, C1. These tubes are then each subdivided a number of times and appropriately interlaced to convey respective streams of the ice cream product to the inner end face P3 of the mould M. For example, tube A1 is joined by a removable clamp A2 to a further tube A3 (Figure 1a) which is then divided (Figure 1b) into subtubes A4 - A9 that feed to respective holes A4 - A9 in the plate P3 as seen in Figure 5. Similarly, the tube B1 is divided into tubes B2 and B3. Tube B2 is connected by a removable clamp B4 (Figure 3a) to

a further tube B5 which is then divided into subtubes B6 - B10 (Figures 1b and 3b) that feed to respective holes B6 - B10 in the plate P3 (Figure 5). The tube B3 is connected by a removable clamp B11 to a further tube B12 (Figure 4a) which is then divided into subtubes B13 - B15 (Figures 1b and 2b) that feed to respective holes B13 - B15 in the plate P3 (Figure 5). Similarly, the tube C1 is divided into tubes C2 and C3. The tube C2 is connected by a removable clamp C4 to a further tube C5 (Figure 4a) which is then further divided into subtubes C6 - C10 (Figure 3b) that feed to respective holes C6 - C10 in the plate P3 (Figure 5). The tube C3 is connected by a removable clamp C11 to a further tube C12 (Figure 1a) which is then divided into subtubes C13, C14 and C15 (Figure 1b or 3b) that feed to respective holes C13, C14 and C15 in the plate P3 (Figure 5).

The tubes A3, B5, B12, C5 and C12 are supported in the orientation shown by a plate P1, and the plates P1 and P3 are interconnected by a plate P2 to furnish the device with the necessary strength and rigidity.

The removable clamps play no part in the function of the device, being provided to enable it to be at least partially dismantled for cleaning. The tubes and subtubes will preferably be made of stainless steel.

Let us assume that colour A will be white, e.g. vanilla; that colour B will be dark, e.g. chocolate; and that colour C will be red, e.g. strawberry. It will be seen from Figure 5, and from the finish product shown in Figure 6, that, in these circumstances, the rear back portion A10 of the bear pattern, which is formed in a compartment A11 of the mould fed by holes A4, A5 and A7, will be white. Also white will be the head portion A12 of the bear formed in a compartment A13 fed by holes A6, A8 and A9.

A forward portion B16 of the pattern, which is formed in a compartment B17 fed by holes B6, B7, B8 and B10, will

be dark. A rear leg portion B18, which is formed in a compartment B19 fed by hole B9 will also be dark. In addition a dark ear portion B20 is formed in a compartment B21 supplied by the hole B13, a dark eye portion B22 is formed in a compartment B23 supplied by the hole B14, and a dark nose portion B24 is formed in a compartment B25 supplied by the hole B15.

The remaining colour, red, will be supplied to border portions of the pattern formed respectively in compartments C17 and C18. The compartment C17 is supplied through holes C6 - C10, and the compartment C18 is supplied through holes C13 to C15.

The diameters of the tubes, especially of the subtubes, and the cross-sections of the holes in the plate P3 through which they feed the ice cream product, together with the number and distribution of the holes in each of the compartments of the mould, are so adjusted, having regard to the shape and cross-sectional area of each compartment, that the correct quantity of ice cream product of each colour stream is fed to each compartment to form the finished product with little or no tendency for the stream in one portion of the pattern to flow laterally into an adjacent portion of the pattern.

If desired, the tubes leading to the mould, and especially the smaller subtubes, and/or the mould itself, can be externally chilled by suitable means (not shown) for maintaining the product at the best temperature for performing the extrusion process and forming the final block that is the objective.

The apparatus as described above will exert a certain amount of "back pressure" on the streams, i.e. a resistance to flow, resulting from the relatively small diameters of some of the tubes. The conventional wisdom in the art of ice cream packaging holds that such back pressure should be minimised to avoid loss of the air trapped in the

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product. It has been found, however, when operating an extruder head as illustrated in the drawings, that the degree of back pressure involved is not in fact a serious problem, and that a very satisfactory final product of good quality can be obtained notwithstanding the relatively small diameter tubes through which the streams must be forced by an incoming pressure provided by the ice cream making machines.

Claims:

1. An extruder head for extruding streams of an ice cream product of at least two different colours into a carton to form a block therein, said block having a substantially uniform cross-section throughout its length, said cross-section defining a pattern of said colours; said extruder head comprising

5 (a) an elongate mould having

10 (i) an outer peripheral wall conforming to the cross-sectional shape of the carton for receiving the carton thereon, and

15 (ii) inner wall portions within said peripheral wall, said inner wall portions including a main inner wall defining an outline of a representation of an animate or inanimate object with a space between said main inner wall and said outer peripheral wall defining a border portion at least partially surrounding said representation, and subsidiary inner walls dividing the main inner wall into a plurality of separate compartments,

20 (b) tube means for conveying said streams to an inner end plate of said mould for passage through holes in said inner end plate and travel along said mould into the carton when said carton is mounted on the outer peripheral wall of the mould, whereby to form said block,

25 (c) said tube means comprising

30 (i) a main tube for conveying each of said streams from a respective ice cream product making machine, and

(ii) a plurality of subtubes extending from each main tube to said inner end plate of the mould,

(iii) said subtubes being connected to feed into each respective said compartment a said stream of

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the colour required for forming aid pattern, said subtubes being of various different sizes, and said holes in the inner end plate also being of various different sizes whereby to feed each said stream into said compartment in an amount required to occupy the cross-sectional area of said compartment.

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2. An extruder head according to claim 1, wherein said pattern of colours includes at least three different colours.

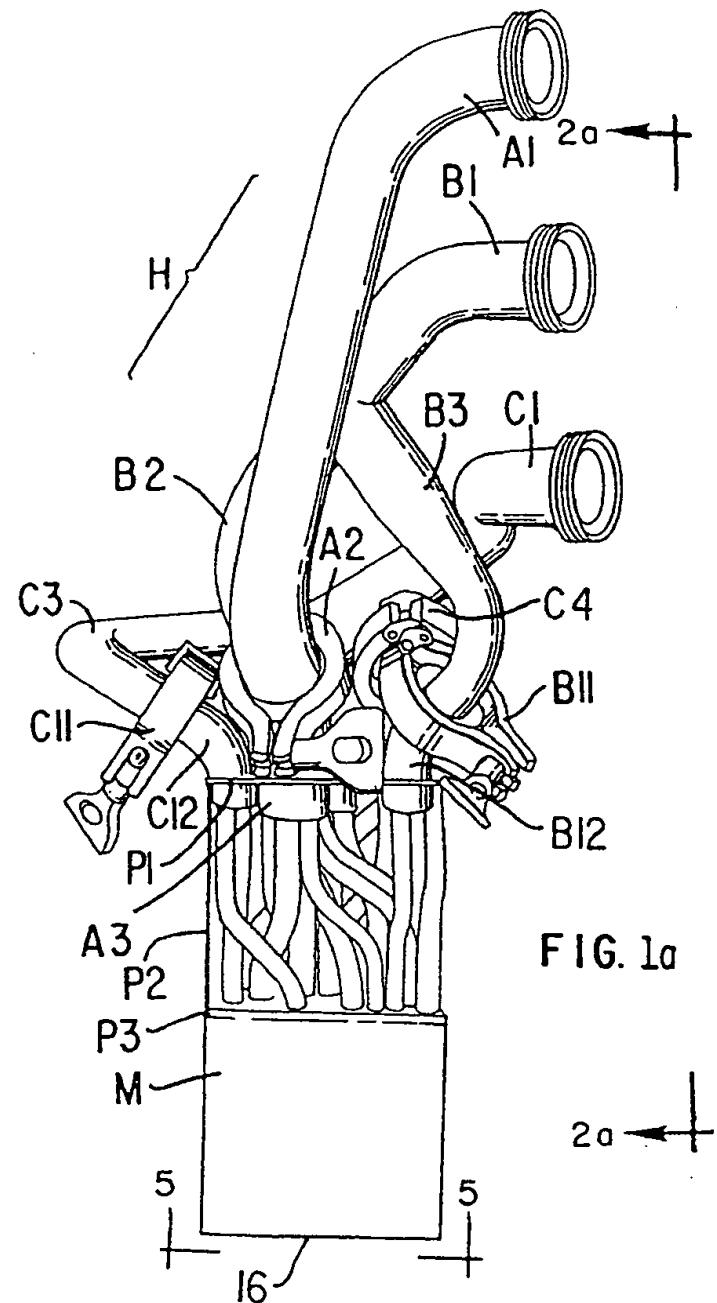
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3. An extruder head according to claim 1, wherein said inner wall portions include subsidiary inner wall portions that subdivide the representation into said separate compartments, the tube means being such that these separate compartments receive stream of different colours from each other while the space defining the border portion receives a stream of a third colour.

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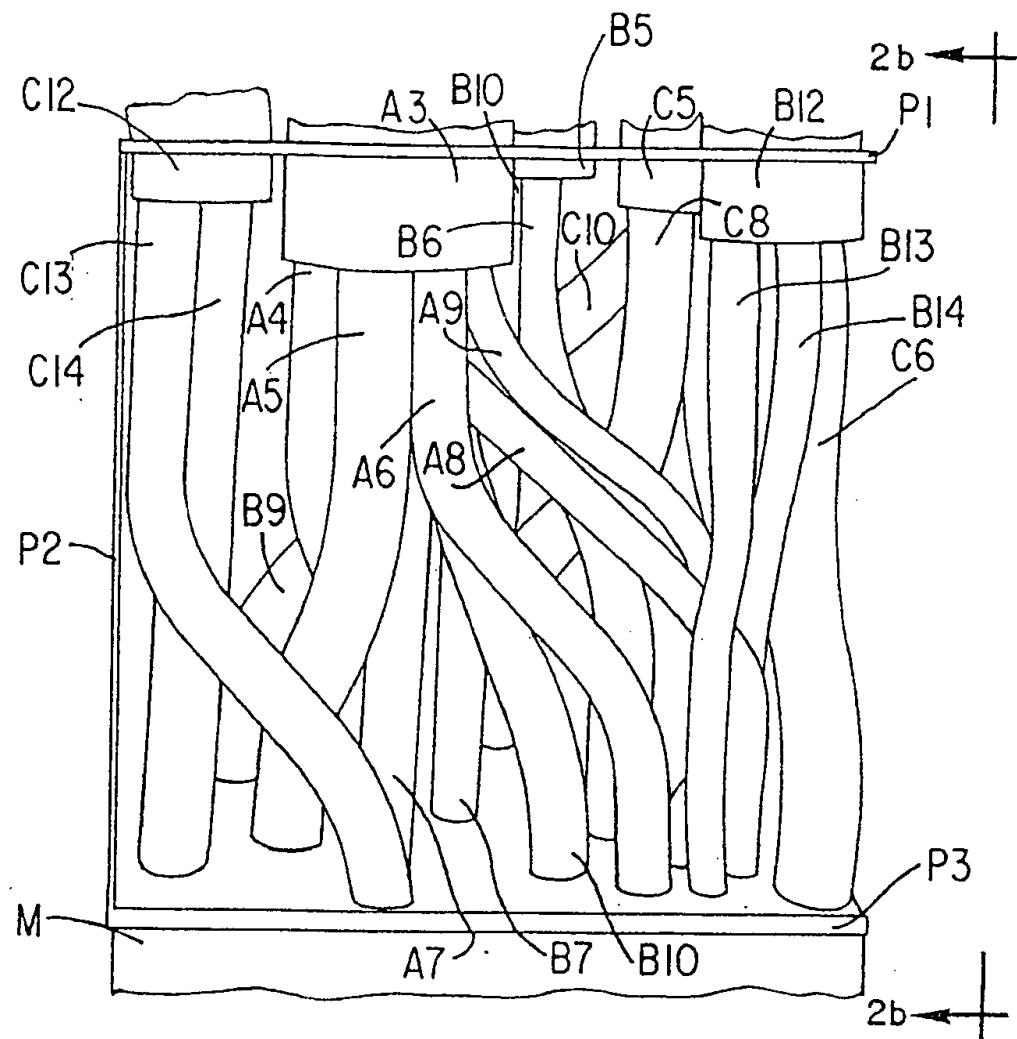


FIG. 1b

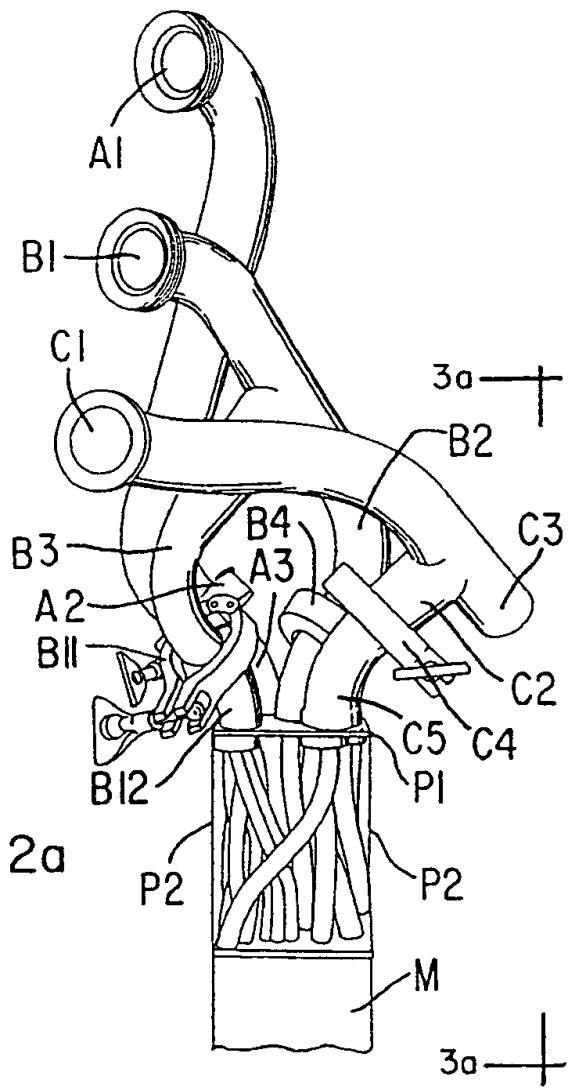
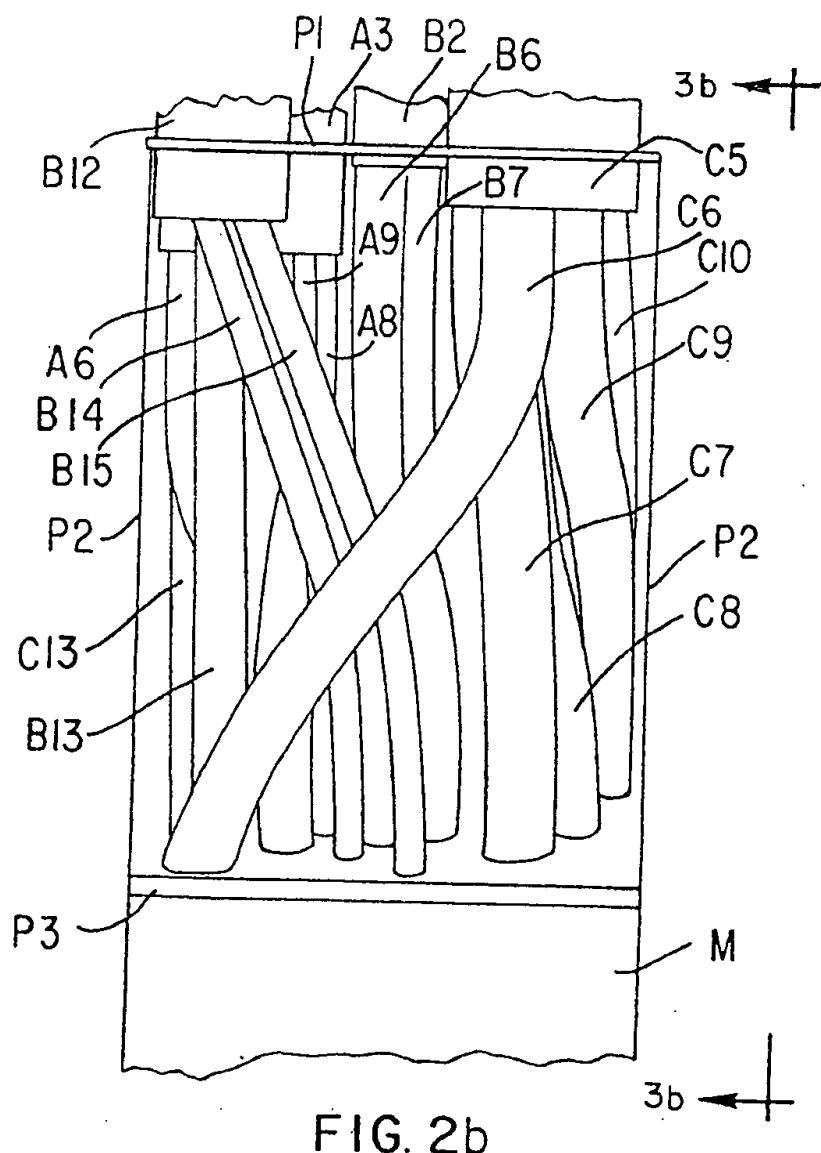


FIG. 2a



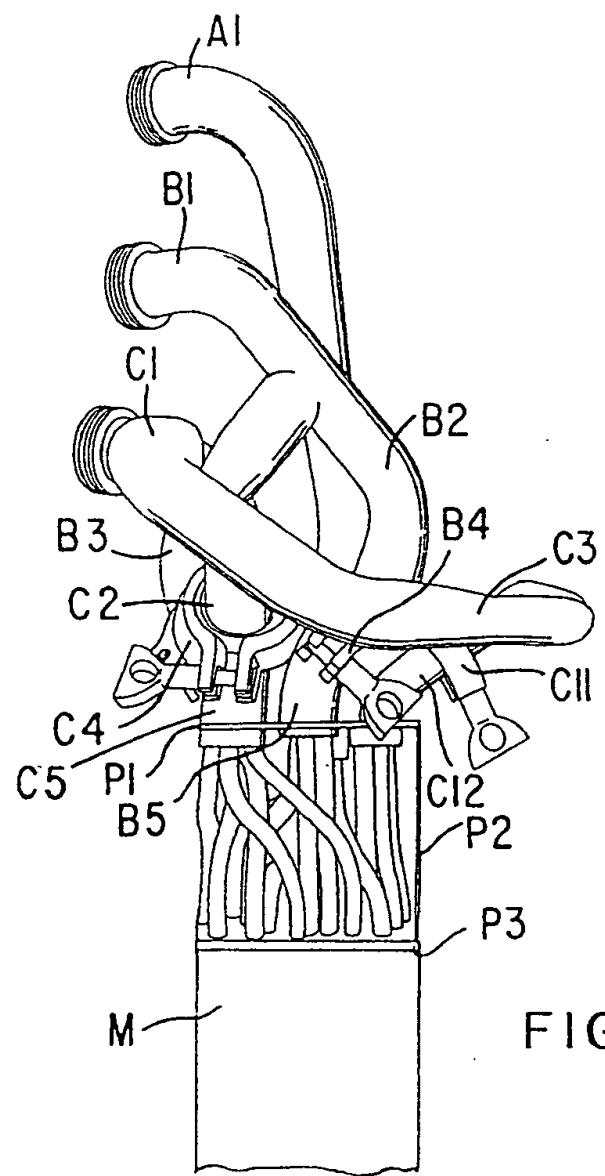


FIG. 3a

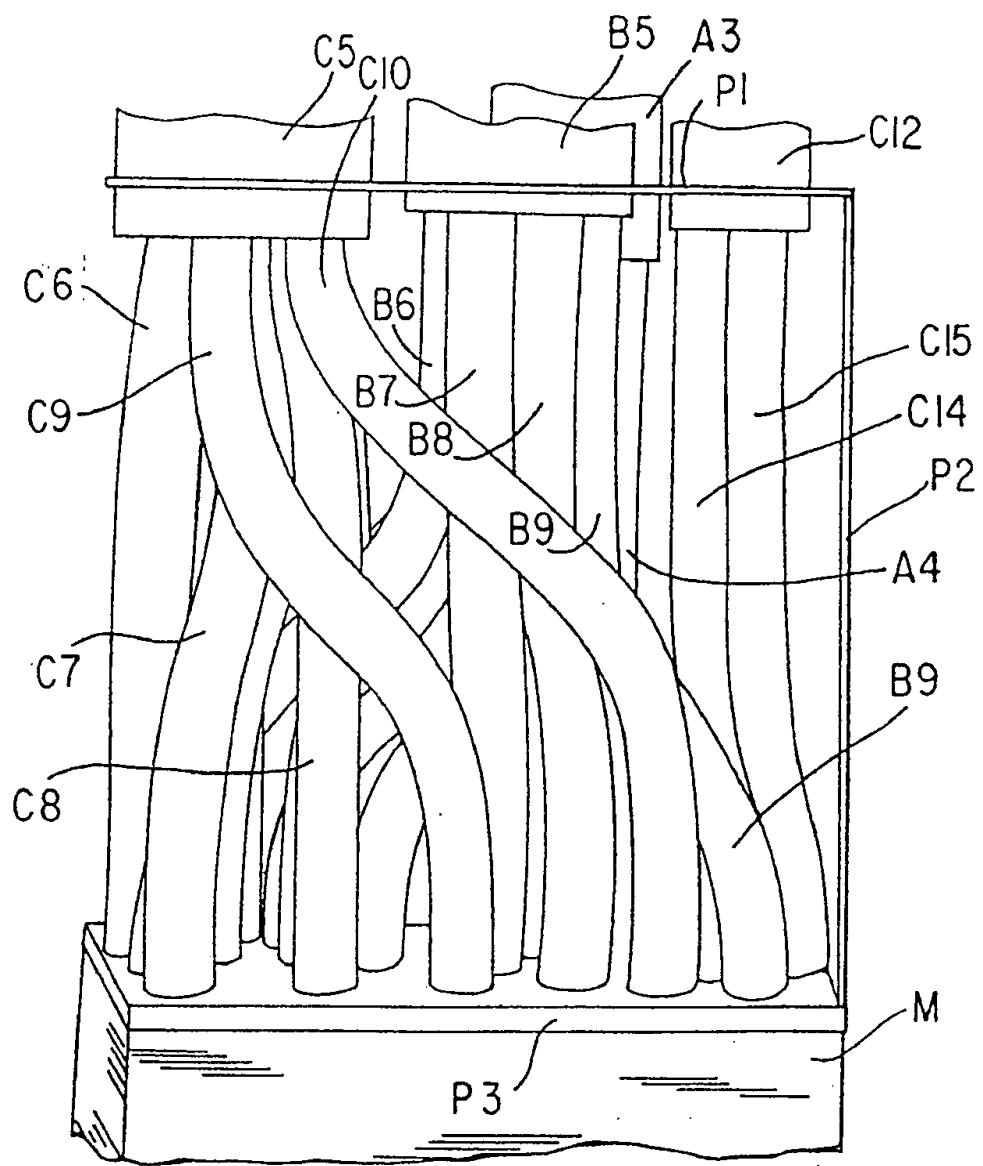


FIG. 3b

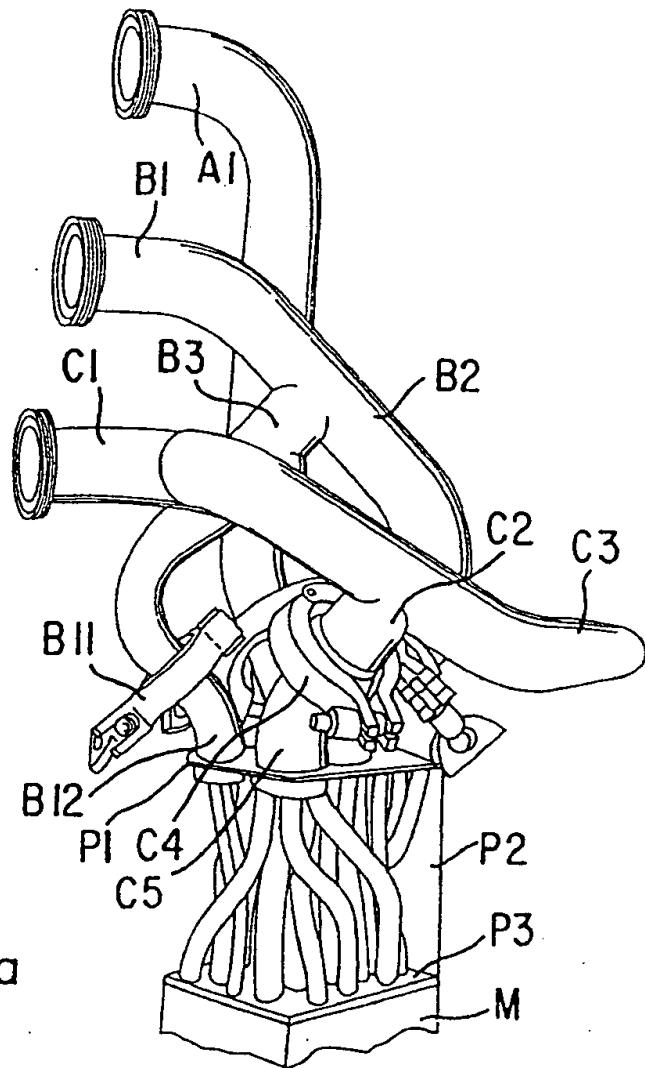


FIG. 4a

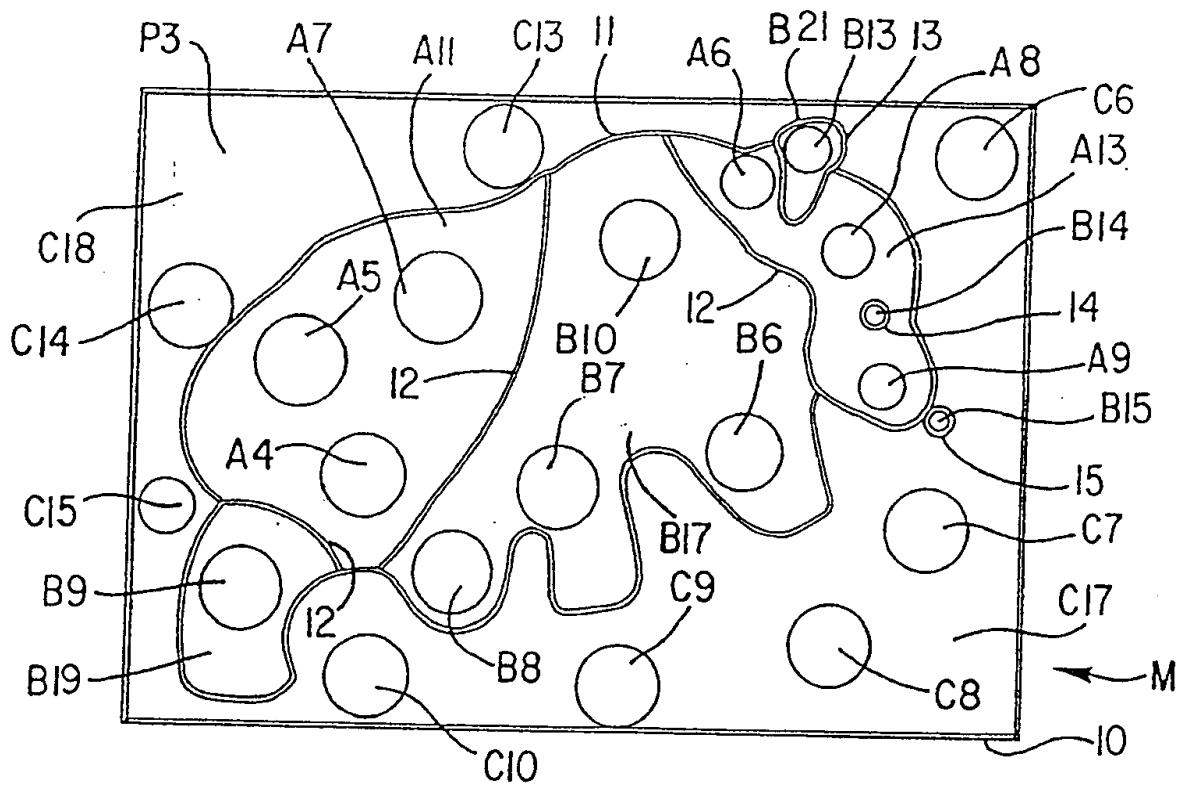


FIG. 5

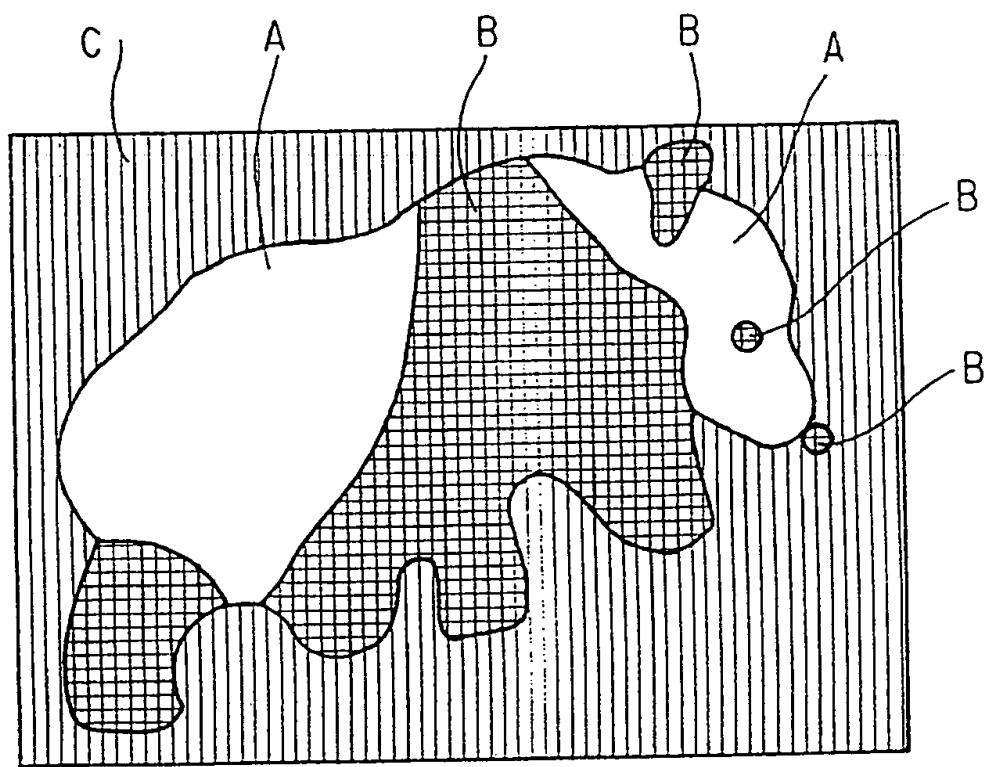


FIG. 6

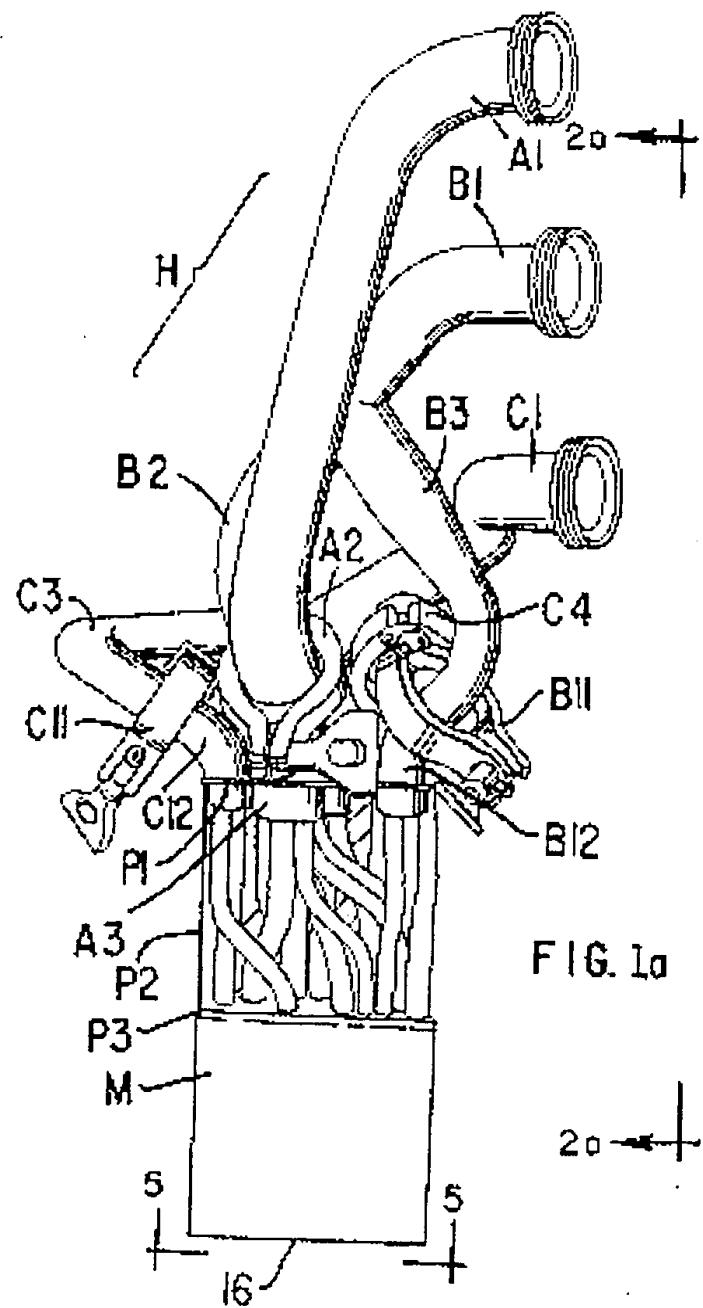


FIG. 1a

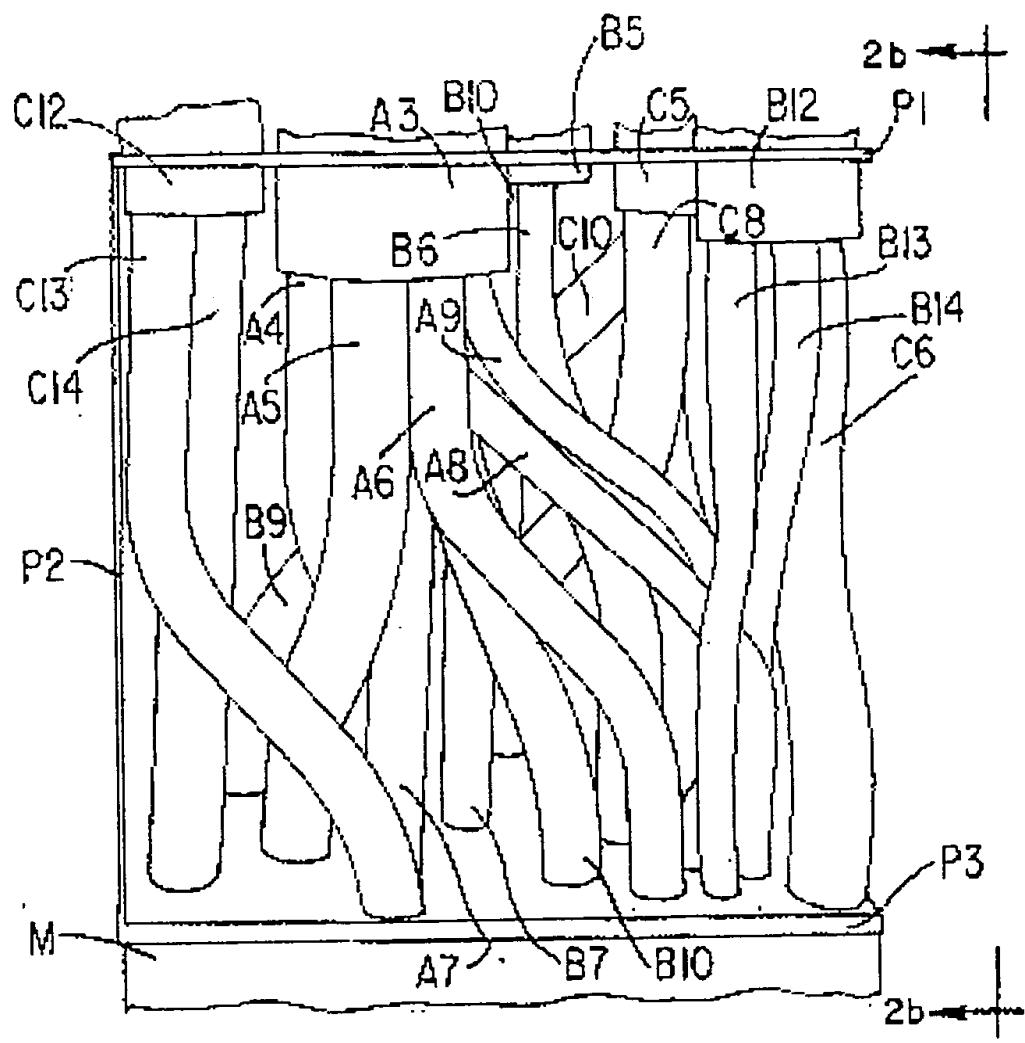


FIG. 1b

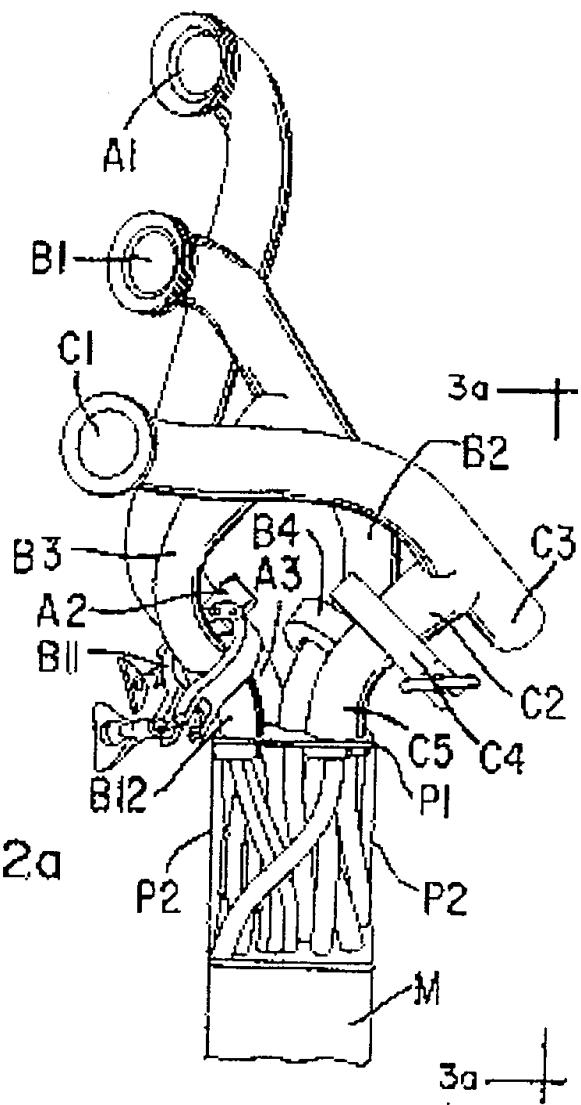
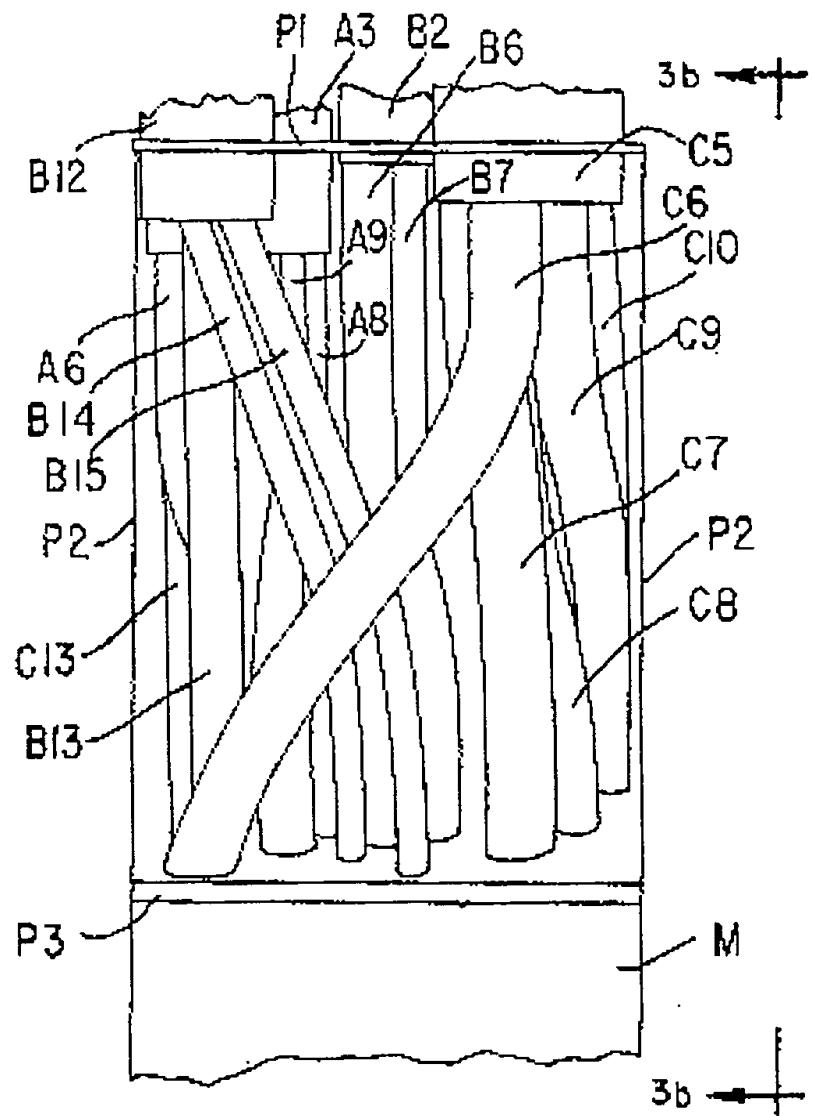


FIG. 2a



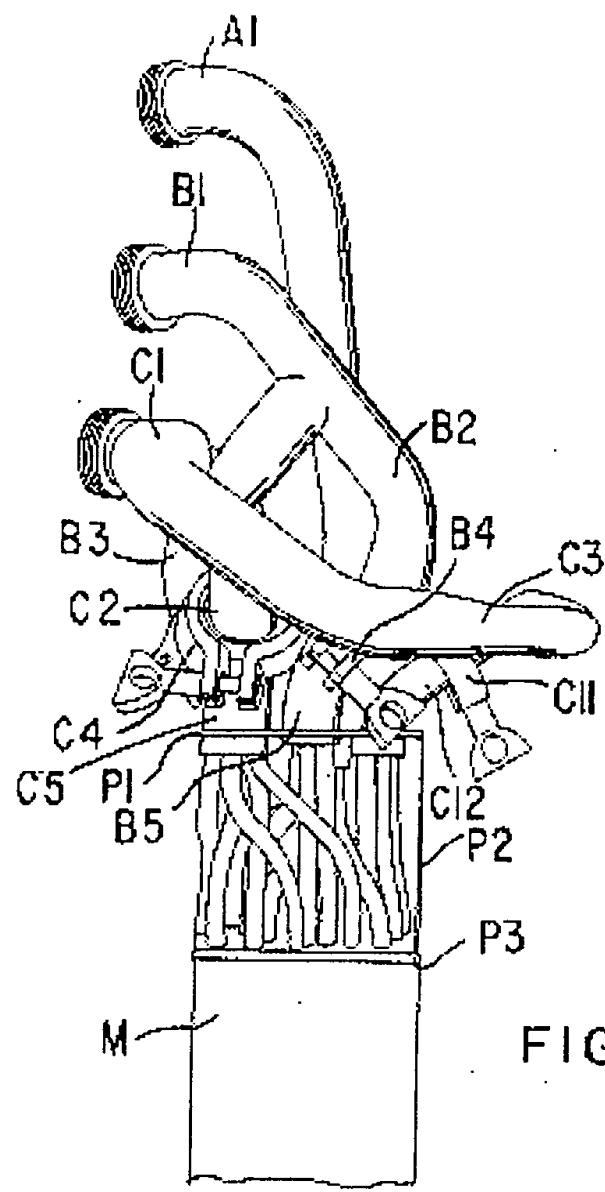


FIG. 3a

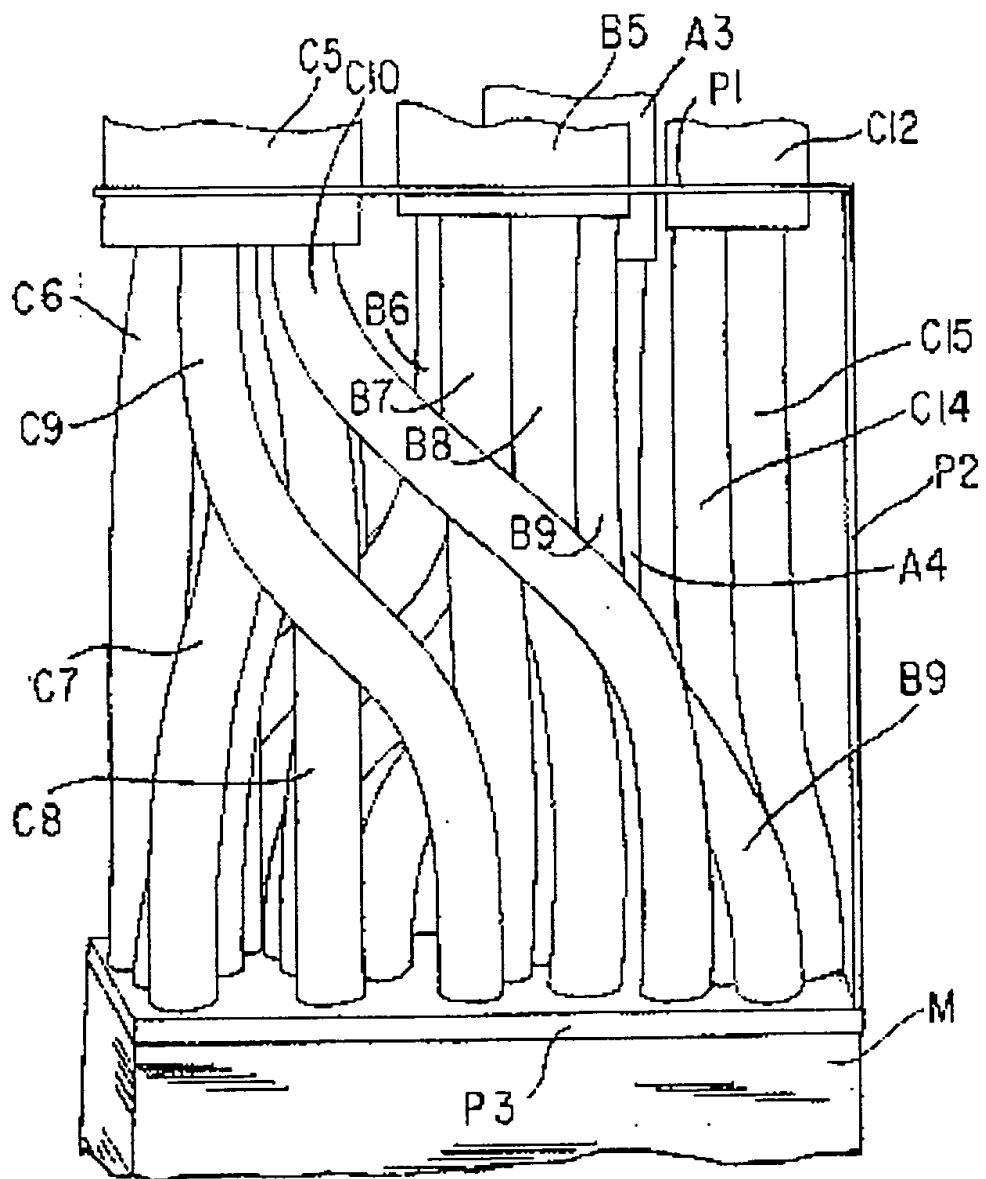


FIG. 3b

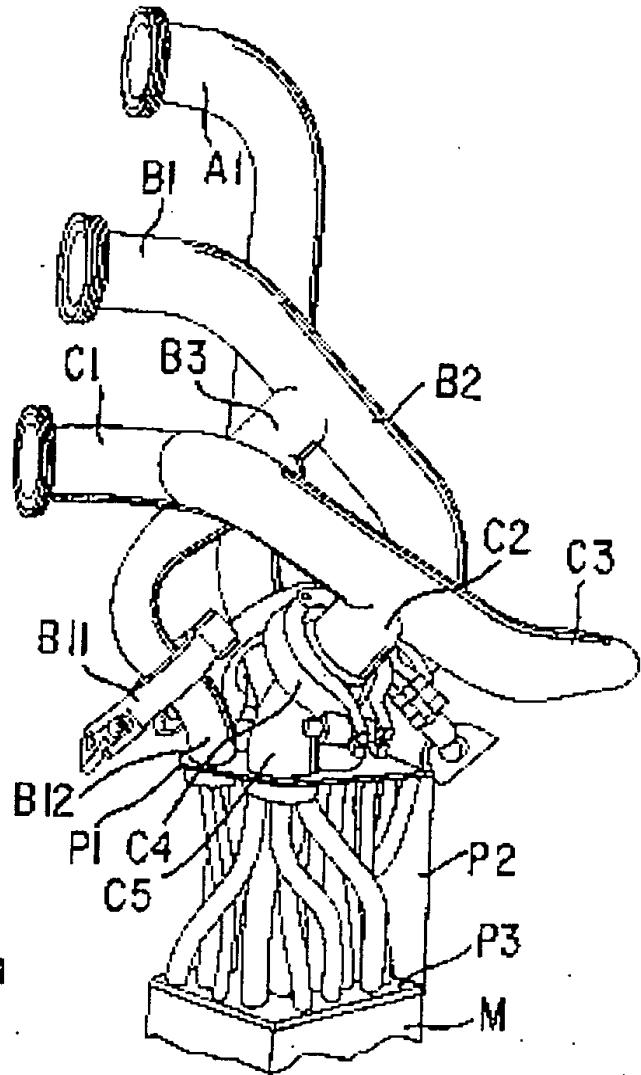


FIG. 4a

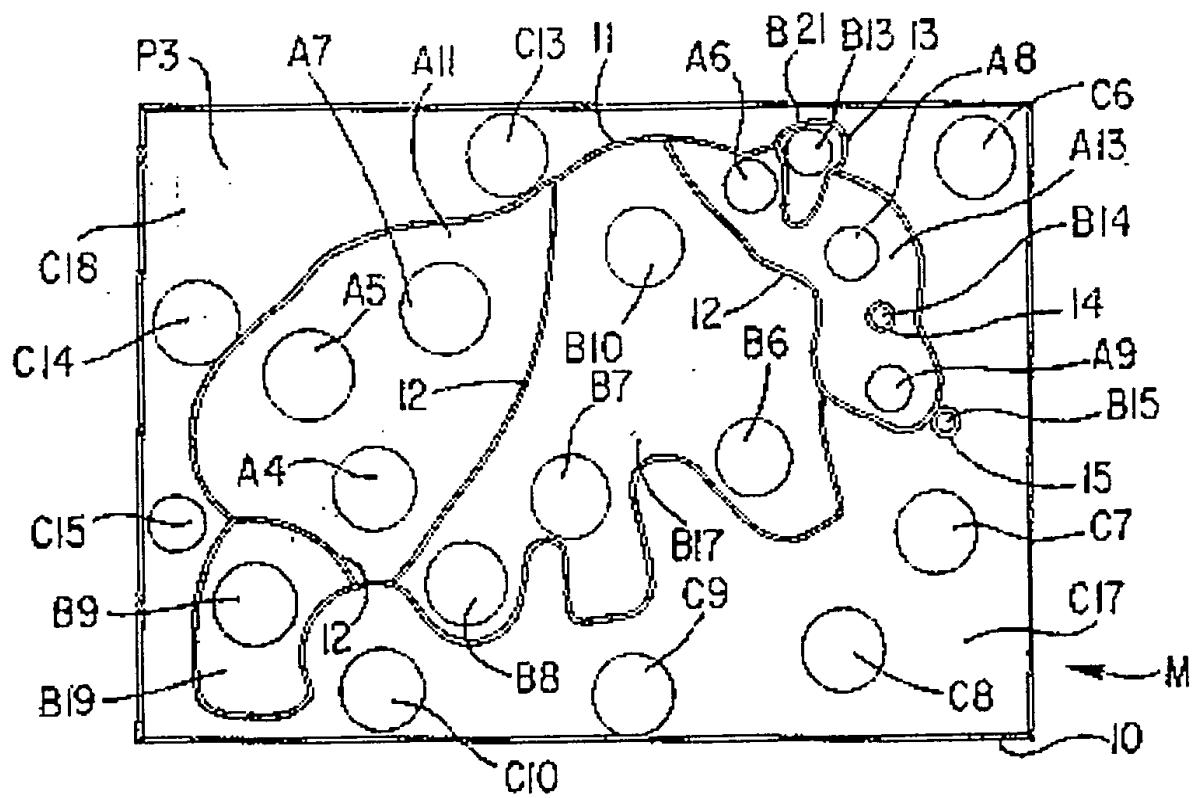


FIG. 5

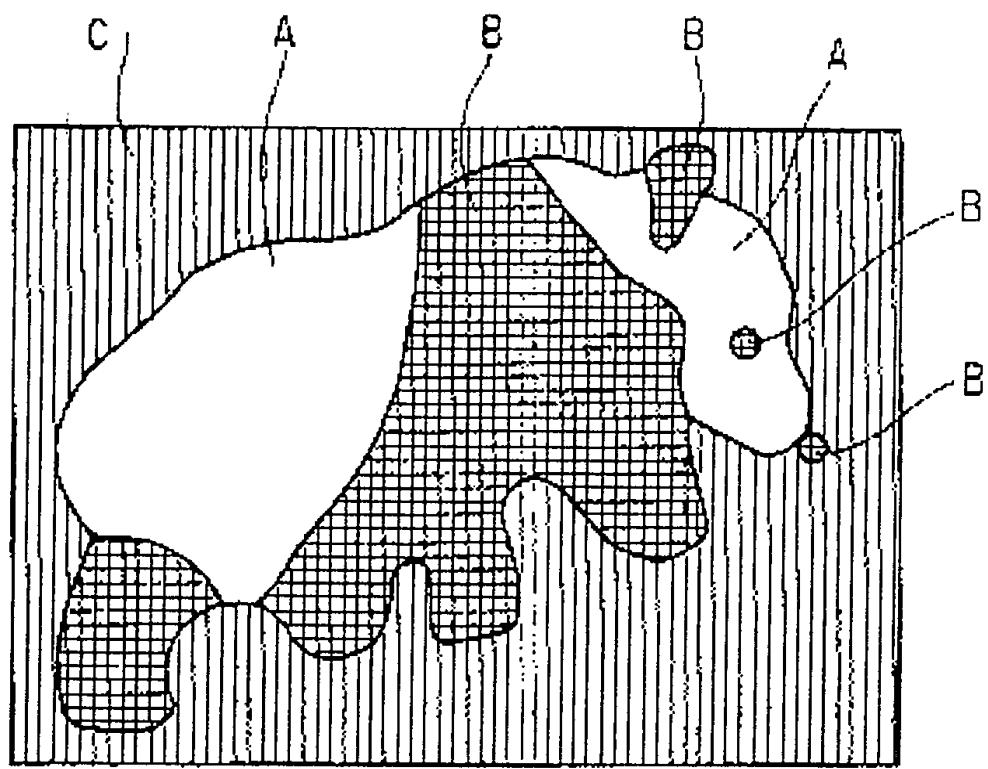


FIG. 6

